March 22, 1946.

S
CONTROL, R-4
Insect
(Annual Report 1945)

Chief, Forest Service
Washington, D. C.

Dear Sir:

The highlights of the insect situation for the year 1945 were (1) rapid build-up during the year of epidemics in two spots of lodgepole pine, one on the Caribou and another on the Teton Forests, and (2) bringing under control a threatened severe epidemic in Engelmann spruce on the Dixie National Forest.

The former has passed beyond the controllable stage due to lack of funds and unless the epidemic subsides because of natural causes undoubtedly it will spread and cause heavy damage in the lodgepole pine stands of the Targhee, Bridger, Teton, Caribou, and Cache group of forests.

If due precautions are observed it is believed the spruce infestation on the Dixie can be kept in an endemic stage.

1. Mountain Pine Beetle (D. monticolae Hopk.)

a. Ashley.

The build-up in the infestation in lodgepole pine on the north side of the Ashley during the year 1945 was not excessive.

The fall of 1944 estimate of new attacks was 6,200 trees and the fall of 1945 estimate was 9,270 on the same area.

CM

No control work was done on this area during 1945 and due to shortage of labor and the low priority given lodgepole pine type none will be attempted during 1946.

b. Cache.

A small number of hot spots totalling 539 trees were treated during the year and the forest is in about a normal stage though very apprehensive about the Caribou epidemic adjacent to the forest.

c. Caribou.

The Caribou continued work through from January 1 to July 25 with all the available force it was able to muster. A few old men were found for overhead and the crew consisted largely of high school youngsters and Mexican nationals.

Good work was done by this crew representing 4,056 man days though costs were high because of winter work and high wages due to overtime and high wage rates. On the treated areas the 1945 estimate shows an average of two new attacks per acre as compared with an average of 15 on adjacent untreated areas.

In round numbers $12,000 was spent on the Brockman-Clear Creek unit in the fall of 1944 and $37,000 in 1945 up to the time of emergence in late July. Some 12,000 trees were treated of an original estimate of 15,000.

The 1944 estimate was greatly in error as the 1945 survey plus the spotting indicated the number should have been estimated at about 21,000. This, of course, gave an erroneous conception of the size of the job to be undertaken and probably had the estimate been more nearly correct the job would never have been undertaken as probably funds could not have been made available for a 21,000-tree job.

The help promised by local operators did not materialize and they removed but about 200 trees due to labor troubles, poor roads and a late spring. These operators, it was hoped, would be able to remove about 7,000 trees and had they done so a number very nearly the total of 21,000 trees would have been treated.

However, the job could not be done and the fall of 1945 estimate indicated a build-up of three to one, making a total in 1945 of 34,000 newly attacked trees on this unit plus 6,000 on the Bear Creek unit adjacent thereto. This epidemic is beyond control.

On other small, isolated spots on the Caribou are an estimated 627 newly attacked trees which the forest plans on treating this spring and for which funds have been allotted.

d. Teton.

The Teton has a heavy epidemic infestation on the Fall-Prichard Creek area with about the same history as the Caribou except that it is about one year later.

The new attacks average twelve per acre as compared with thirteen on the Caribou.

The location and relation of these two epidemics are shown on the attached map and it can readily be seen that the Caribou with an estimated 40,000 attacked trees and Teton with 12,000 together are a formidable threat to the lodgepole pine type of the Targhee, Teton, and Bridger Forests.

In order to obtain a bird's-eye view of the entire situation aerial reconnaissance was made of the territory between the Teton and Caribou epidemics. This was not entirely successful as due to rugged terrain and deep canyons the plane was forced to fly at such elevation that nothing but large epidemics could have been seen. No additional areas of heavy epidemic were seen. Ground reconnaissance was made by the local force however, and nothing was reported by the forests concerned with the exception of the Targhee.

e. Targhee.

The Targhee reported a mild epidemic at the head of Elk Creek - shown in blue on the attached map. They report the 1944 attacked trees on this area averaging 1.9 per acre and the 1945 new attacks as averaging 1.3. The epidemic is continuing although not building up as yet.

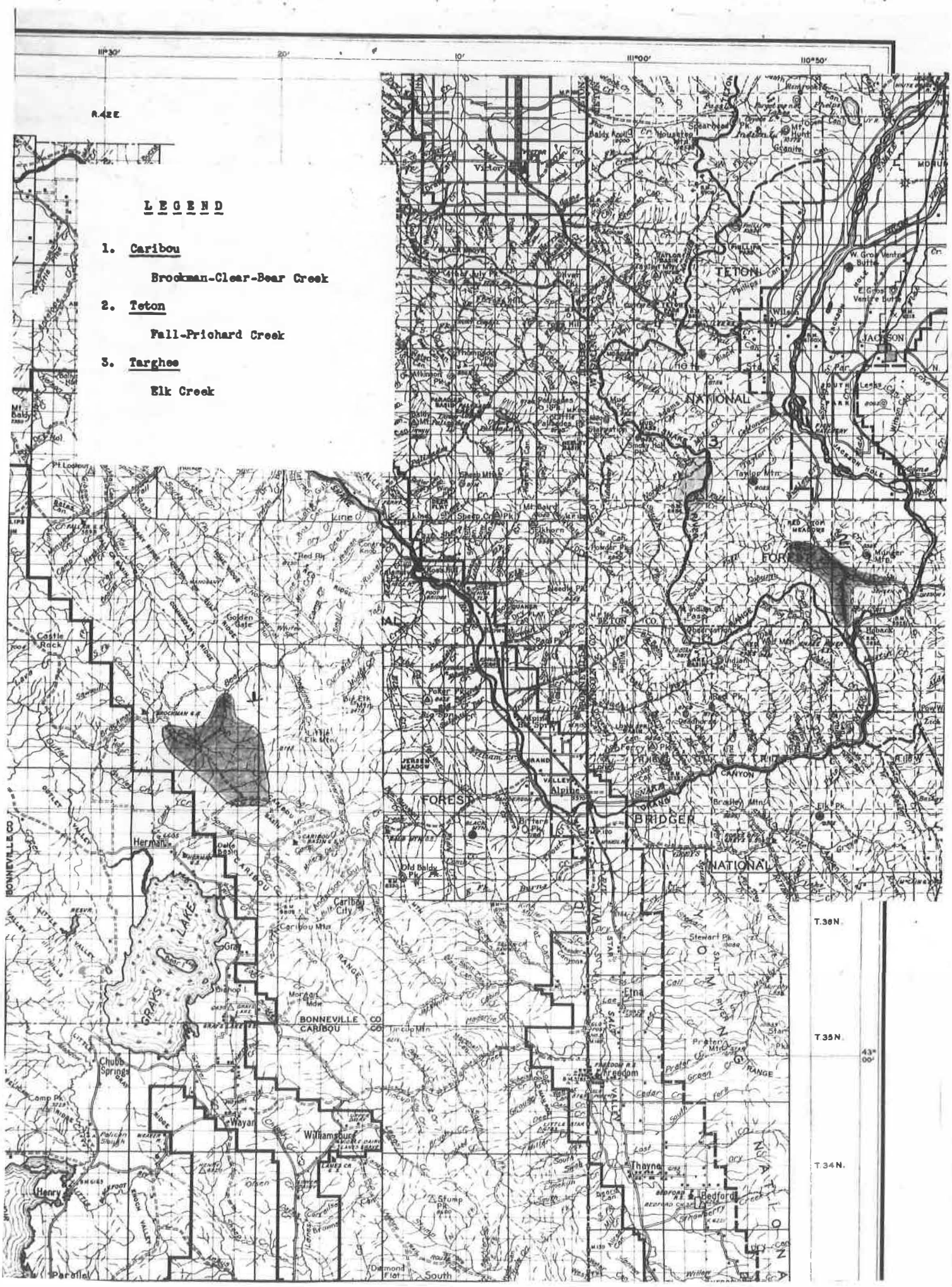
Elsewhere on the Targhee the situation is quiet except for several small groups in Shotgun Valley which will be treated this spring.

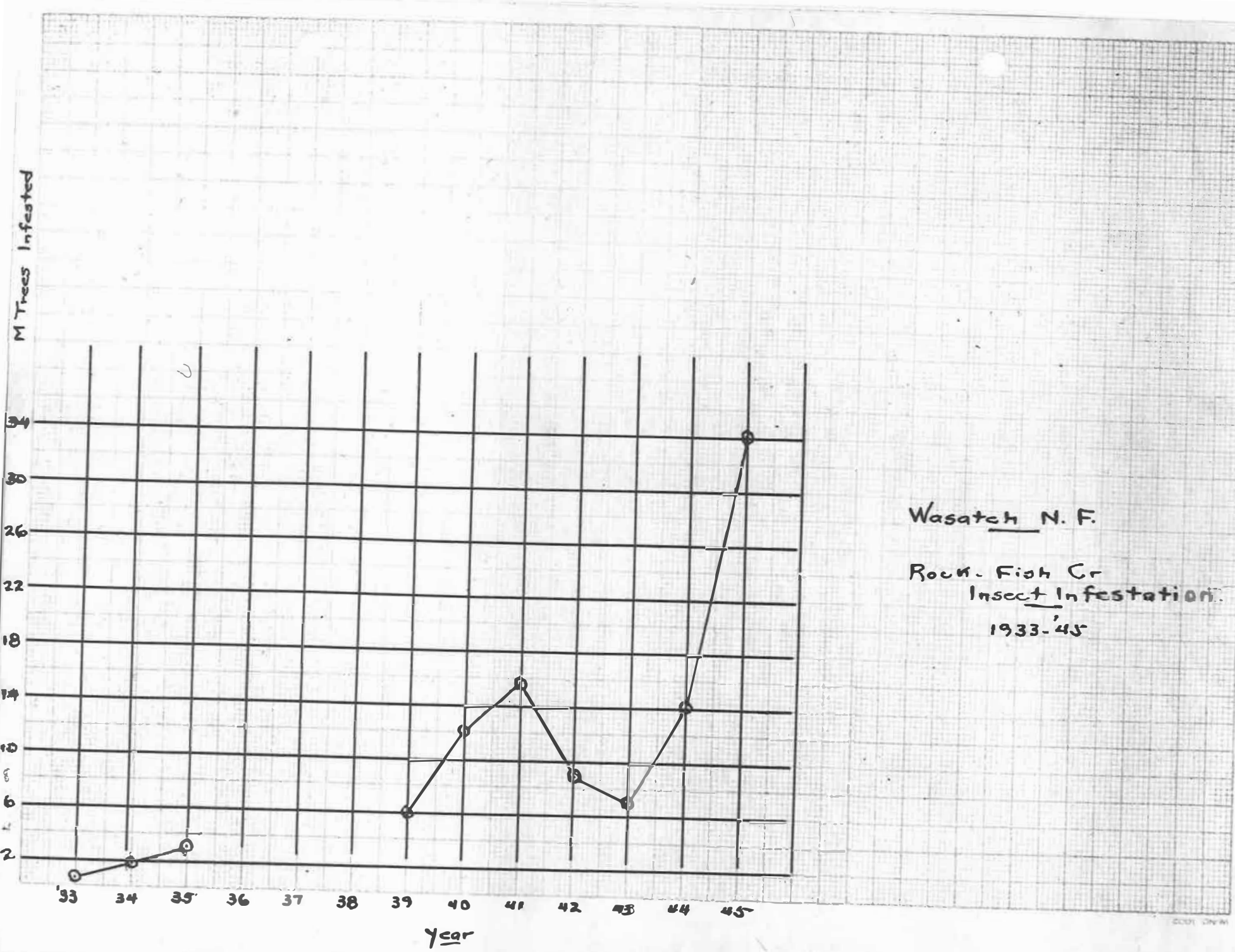
Due to the accessibility and demand for lodgepole pine timber on the Targhee the local force will make an extensive reconnaissance of the lodgepole pine type in June when fading tops can readily be seen and this reconnaissance will be followed up by a more thorough preliminary examination conducted by the Bureau of Entomology and Plant Quarantine personnel.

f. Wasatch.

With the exception of the Rock-Fish Creek unit, work on which was abandoned for the duration, the Wasatch reports everything quiet with the exception of one small spot of mild epidemic on Blacks Fork totaling 260 trees.

The forest has done a very good job of cleaning up a bad epidemic. The big job was accomplished in 1941 and a clean-up job of from 1,000 to


LEGEND
1. Caribou
Brockman-Clear-Bear Creek
2. Teton
Fall-Prichard Creek
3. Targhee
Elk Creek
R.42E.
111°30'
20'
10'
111°00'
110°50'
T.36N.
T.35N.
T.34N.
43° 00'
BONNEVILLE CO
CARIBOU CO
TETON CO
TETON
NATIONAL
FOREST
BRIDGER
JACKSON
Hermanu
Caribou City
Caribou Mtn
Chubb Springs
Wayan
Williamsburg
Henry
Freedom
Thayne
Bedford
Alpine
Elna
Stump Pk
Diamond Flat
South
Parallel



Wasatch N. F.

Rock. Fish Cr
Insect Infestation.
1933-'45

4,000 trees per annum on one unit after another during the years 1942, 1943 and 1944 has reduced the infestation to endemic proportions. No work at all was necessary during 1945.

The situation on Rock-Fish Creek can be used as a check area as indicative of what might have happened elsewhere on the forest had no work been done. The estimates there are as indicated on the attached graph.

It will be observed that this infestation built up rather slowly during the years 1933 to 1939 and then very rapidly during 1940 and 1941. It appeared to be rapidly subsiding during 1942 and 1943 but during 1944 and 1945 has built up at a two to one rate in 1944 and two and one-half to one rate during 1945.

This infestation has been noteworthy because of the fact that it has not spread to adjacent areas during the 13-year period it has been under observation. It is expected that the host material will soon be exhausted on the presently infested areas and that when that time comes the tremendous insect population is likely to infest very heavily the adjoining tracts of lodgepole pine.

g. Other Forests.

Other forests have nothing to report.

2. Black Hills Beetle (D. ponderosae Hopk.)

a. Ashley.

Some 1,319 ponderosa pine trees were treated on the north side of the Ashley in 1944. The fall survey indicated 840 trees to treat on that area in scattered trees and of an endemic nature. No control work was done during 1945. The 1945 survey however, indicates a total of 1,940 trees on this area with about 1,200 in an epidemic stage. These areas will be treated this spring. Other areas are endemic in proportion and will not be treated. Funds for this work have been allotted.

It is planned to make a field test this spring of treatment with "ortho" on a portion of the area to be treated. It has been stated that this treatment is successful even in the case of thick-barked ponderosa pine and a test will be made of this theory.

b. Dixie.

1. Dixie Division.

No work was done except to clean up a small infestation on the Pass Creek unit where a total of 257 trees were treated.

The forest is now in a very low endemic stage.

2. Powell Division.

The Powell infestations were cleaned up in 1944 and during 1945 for the first time since 1936 no work was necessary.

During the period 1936 to 1944 inclusive, a total of 45,754 trees were treated on the Powell and it is obvious that the damage to timber was severe.

c. Other.

The Fishlake reports "infestations of Black Hills beetles are found in ponderosa pine in Deep Creek on the east slope of Thousand Lake Mountain in South Water Hollow and in Beaver Canyon. The infestations are mostly very light with fewer infestations than last year." These infestations need cause little concern as the stands are largely non-commercial.

3. Engelmann Spruce Beetle (D. engelmanni Hopk.).

Dixie.

The insect epidemic in Engelmann spruce on the Dixie and the control work done were unique inasmuch as this was the first epidemic in spruce in Region 4 where control work was undertaken and carried through to a successful conclusion. It also was out of the ordinary due to the fact that a good deal of information concerning the life history and habits of the bark beetle responsible for the damage had to be studied out after control work had been begun and changes in control methods had to be made as new developments occurred.

The epidemic was first discovered in the fall of 1944. It apparently had built up rapidly during that year and when detected several large hot spots of several hundred trees each were found in a body of Engelmann spruce of about 20 sections. It was estimated at that time that there were about 1,000 infested trees though the record of work and survey estimates indicate a total of 2,561, 1944 attacks of which about 1,150 were in the large groups.

As far as was known here in the fall of 1944 the Engelmann spruce beetle had about the same life cycle as other bark beetles such as the mountain pine and Black Hills beetle, namely a one-year life cycle and control work was started in the fall of 1944 on that basis. A total of 595 trees were felled, and most of the infested logs removed by mill operators and slabs burned. Bark on stumps was peeled and burned.

It was estimated at the close of work that fall that a felling and treating job of 400 to 500 trees remained for execution in the spring of 1945. The trees being large, a power saw was moved onto the job and plans were made for decking for burning by the use of tractors.

During the winter however, the Bureau of Entomology and Plant Quarantine had learned of the two-year life cycle of the bark beetle and also of the effectiveness of "ortho" in control. This called for a change from decking and burning to "ortho" spraying though the trees still had to be felled. It also called for a careful check of stumps and roots for the hibernating beetles.

Work was begun in the spring of 1945 on this basis. Trees were felled and logs sprayed and examination made of their bases and roots. Two things were discovered immediately which necessitated an immediate change in control methods:

1. Woodpeckers had accounted for 90 to 95 percent of the brood in the boles of the 1944 attacked trees down to snow line. This eliminated any necessity for falling the tree and instead snow and duff were removed down to mineral soil and roots, stump and bole below snow line were sprayed with "ortho".

2. Heavy brood was found not only in the stumps of trees attacked in 1944, but also in the stumps and bases of trees attacked in 1943 and in all stumps from timber sale trees cut during 1943 and 1944. Therefore, stumps from 1943 attacks plus timber sale stumps had to be dug out and sprayed also.

In order to effect control the following work had to be done.

1. 1944 Attacks

Fall 1944 -	Trees felled and sawmilled	595
Spring 1945	" " " sprayed	59
	Trees sprayed at base and stumps	1,142

2. 1943 Attacks

Tree bases and stumps sprayed	1,211

3. Timber sale

stumps sprayed (1943 & 1944 attacks)	2,249

The control work seemed to be entirely successful as the fall of 1945 survey indicated no hot spots and a total of but 800 singles scattered over 20 sections of host type.

Perhaps not all is known as yet that needs to be known about the life history and habits of the Engelmann spruce beetle. The same is true with respect to the woodpeckers. We are told by specialists that probably woodpeckers will continue their work as long as there is an ample food supply. We do not know whether the reduction in insect population during 1945 was sufficient to discourage them or not. Observation of some old spots of infestation encountered on the survey indicated that apparently the infestation built up from a single infested tree to about a dozen or more trees in the group during the course of a number of years at which time woodpeckers moved in and cleaned up the infestation. Apparently however, they were not attracted by the 1,200 to 1,500 trees attacked in 1943 but when this had doubled in 1944, moved in and cleaned up the 1944 hot spots as well as the scattered singles.

However, if the woodpecker work should cease it is believed that if the beetles encountered on this area are of the two-year cycle variety and therefore spend one winter in hibernation, it will be possible to treat by spraying the bases of trees and stumps when the beetles are hibernating therein and no tree falling will be necessary. This work is readily accomplished as the crew averaged 12 stumps and bases per man day as compared with less than one tree per man day felled and treated. Careful search will have to be made, of course, to find all places of hibernation.

It is believed therefore that of the 800 trees attacked in 1945 woodpeckers will account for most of the brood in the boles of the trees this winter. After hibernation of the balance bases of trees and stumps will be sprayed this fall if the work appears justified.

The entire area will be closely checked by this office and the Bureau of Entomology and Plant Quarantine the coming season.

A good deal of credit is due the Bureau of Entomology and Plant Quarantine for their ferreting out the habits of this beetle in short order and also to the local forest personnel for their prompt and aggressive action in all phases of control work which involved several about-faces in methods of control which were effectuated in short order. It appeared for a time that a spruce stand of 45 million feet was doomed as well as the spruce stands on the Cedar Breaks National Monument immediately adjacent.

4. Other.

A good deal of discussion was held on the ground at Cedar Breaks National Monument and Bryce Canyon National Park last spring between members of this office, the Bureau of Entomology and Plant Quarantine and National Park officials. The main point of discussion was the

control work being done in Engelmann spruce and steps were taken and agreements reached so that work and efforts on the two areas were coordinated and done at the same time.

A good deal of discussion was had relative to an attack of needle miner (Epinotia meritana Heinrich) on white fir (Abies concolor) along the Bryce Canyon Park highway within the Park. Entomologist Terrell states "control of this outbreak would probably not be difficult or costly if sprayed by a plane but any plan of control must be considered from a realistic viewpoint in relation to the white fir stands in the Dixie National Forest which lies adjacent to the west. The needle miner has not as yet been reported on the national forest. Because of a difference in objectives white fir is not a valuable tree on the national forest - it is considered a weed tree. Control in the national forest then could not be justified. On the other hand, the white fir within the national park is as valuable as any tree and its loss would be seriously felt.

"It is possible that control measures could be applied to the Park only and prove successful even though the infestation spreads into the national forest. Such control measures would have to be repeated on an annual basis until the outbreak ran its course."

A similar situation exists relative to insect depredations in alpine fir at Cedar Breaks National Monument. Entomologist Wygant reports "Unfortunately Dryocoetes confusus is taking a heavy toll of the alpine fir at Cedar Breaks National Monument. . . . . A severe infestation covers the entire alpine ~~fir type~~ in the area. The local Park Service officers and the Regional Forester (Park Service) are much concerned about the matter. Correspondence last winter with Dr. Craighead and the western station leaders led to the general conclusion that the chances of controlling the alpine fir beetle within Cedar Breaks were not too good when adjacent areas go uncontrolled."

In our discussions we pointed out to the Park Service officials that we would be glad to do all in our power to assist them but that in view of the fact that sufficient funds were not available for control of commercial species our hands were tied insofar as treatment of inferior species such as white and alpine fir were concerned. We also stated we could not concur in treatment with DDT from planes where live fishing streams on the forest were concerned.

Everything possible should be done to assist the Park Service in maintaining scenic values and we would be glad to do any suggested work for which funds might be allotted.

We may expect considerable criticism and justifiably so if we do not do something to head off the threat to the lodgepole pine stands of the Teton and Yellowstone Parks and assist the Park officials with threats to Bryce Canyon and Cedar Breaks units.

5. Conclusion.

An $8,000 job in ponderosa pine on the Ashley and $1,000 for lodgepole pine on the Caribou are all that will be attempted in the way of control projects in Region 4 during 1946.

For the following situations no funds and/or labor are available:

Caribou	-	40,000	infested	lodgepole pine
Teton	-	12,000	"	" "
Ashley	-	9,000	"	" "
Wasatch	-	34,000	"	" "

Very truly yours,

W. B. RICE, Regional Forester,

By H. J. Ford

Enclosures.

2 - Chief
1 - Wygant
1 - Eubbers

1945

I N S E C T C O N T R O L S U M M A R Y

SUMMARY
" E-4

Year	Name of Unit	Forest	Duration of Project (Incl. dates)	Tree Species Affected	Insect Responsible	Method Followed	Acres Treated	Trees Treated	Percent Trees Killed	Expenditures					Total Cost per Tree	Total Cost per Acre	Oil Used Gal. per Tree	No. Man Days Used	Percent Reduction Obtained
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	P & M (13)	Cont. Time & Expenses (14)	Total Cost of Project (15)	(16)	(17)	(18)	(19)	(20)
1945	Cache		5/14-7/25/45	P.contorta	D.monticolae	Fell & burn	4,420	539	100			934.50	378.20	1,312.70	2.44	.30	0	149	
"	Caribou		1/1 -10/31/45	" "	" "	" " "	3,000	8,180	100			35,206.95	2,175.00	37,381.95	4.56	12.46	1.50	4056	
"	Dixie		5/15-6/15/45	P.ponderosa	D.ponderosae	Fell & orthe	600	257	100			1,212.00	19.00	1,231.00	4.79	2.05	0	172	
"	"		6/11-7/21/45	P.engelmanni	D.engelmanni	Fell & burn	1,820	4,561	1			4,292.00	207.00	4,499.00	.97	2.47	1.00	377	
						Ortho													

REMARKS:

I N S E C T C O N T R O L S U M M A R Y

CACHE NATIONAL FOREST

Year (1)	Name of Unit (2)	Forest (3)	Duration of Project (Incl. dates) (4)	Tree Species Affected (5)	Insect Responsible (6)	Method Followed (7)	Acres Treated (8)	Trees Treated (9)	Percent Trees Killed (10)	Expenditures (11)	(12)	P & M (13)	Cont. Time & Expenses (14)	Total Cost of Project (15)	Total Cost per Tree (16)	Total Cost per Acre (17)	Oil Used Gal. per Tree (18)	No. Man Days Used (19)	Percent Reduction Obtained (20)
1943		Cache	11/8 to 11/10	P.contorta lat.	D.monticolae	Fell and burn	20	55	100			50.00	25.00	75.00	1.36	3.75	1.0	8	
1944	Trail Hollow-Pearl Creek		10/8 to 10/31/44	" "	" "	" " "	6.000	190	100			260.12	67.60	327.72	1.72	0.546	-	40	
1944	Willow Springs, Green Basin, Paris Flat		10/14 to 10/28/44	" "	" "	" " "	2.200	97	100			247.68	20.00	267.68	2.75	.1216	"	32	
1945	Trail Hollow - Pearl Creek	"	6/13-6/27/45	" "	" "	" " "	1,000	130	100			226.94	65.76	292.70	2.27	.029	None	30	
"	Copenhagen	"	7/14-7/25/45	" "	" "	" " "	260	174	100			256.00	120.00	376.00	2.16	1.44	"	41	
"	North Canyon	"	5/24-7/26/45	" "	" "	" " "	1,300	126	100			153.56	117.00	270.56	2.15	.21	"	34	
"	Paris Flat	"	6/25-7/2/45	" "	" "	" " "	1,500	70	100			225.00	36.44	261.44	*3.73	.17	"	33	
"	Miles Canyon	"	6/2-6/20/45	" "	" "	" " "	360	39	100			71.00	39.00	112.00	**2.87	.31	"	11	
							4,420	539	100			534.30	376.20	1,312.70	2.44	.30	0	149	

* Scattered trees. ** ½-mile hike to area

REMARKS:

I N S E C T C O N T R O L S U M M A R Y

CARIBOU NATIONAL FOREST

Year	Name of Unit	Forest	Duration of Project (Incl. dates)	Tree Species Affected	Insect Responsible	Method Followed	Acres Treated	Trees Treated	Per-cent Trees Felled	Expenditures					Total Cost per Tree	Total Cost per Acre	Oil Used Gal. per Tree	No. Man Days Used	Percent Reduction Obtained	
												P & M	Cont. Time & Expenses	Total Cost of Project						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	
1940	Rattlesnake Basin	Caribou	6/4 to 6/12/40	L. P.	D.conticolas	Barred standing with oil and felled and burned	100	149	40			-	109.42	109.42	.734	1.094	3/4	28	90	Controlled
1944	Clear Creek-Brockman		9/9 to 12/31/44	"	" "	Ortho.) Barr) Fell)	640	1,291 132 2,280 3,703	100 100 100			11,222.99	1,036.79	12,259.78	3.31	19.16	1-1/2	1,051	20	
1945	Clear Creek - Brockman	"	1/1 - 10/31/45	"	" "	" " "	3,000	8,180	90			35,206.95	2,175.00	37,381.95	4.56	12.46	1-1/2	4,056	84	

REMARKS:

I N S E C T C O N T R O L S U M M A R Y

DIXIE NATIONAL FOREST

Year	Name of Unit	Forest	Duration of Project (Incl. dates)	Tree Species Affected	Insect Responsible	Method Followed	Acres Treated	Trees Treated	Percent Trees Felled	Expenditures (11)	(12)	P & M (13)	Cont. Time & Expenses (14)	Total Cost of Project (15)	Total Cost per Tree (16)	Total Cost per Acre (17)	Oil Used Gal. per Tree (18)	No. Man Days Used (19)	Percent Reduction Obtained (20)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)										
1942	Strawberry-Swains #2	Dixie	6/1 - 6/27 11/9 - 12/19	P. P.	D.ponderosae D.barberi	Fell, peel and burn	6,480	458	100			2,822.11	42.00	2,864.11	6.25	.442	-	485	
1943	Upper Mammoth #3		4/20-6/19	P. P.	" " "	" " "	2,840	553	100			4,195.30	SC.44	4,275.74	7.73	1.51	-	578	
1943	Strawberry-Swains #2		10/22-11/3	"	" " "	" " "	750	18	100			366.00	6.40	372.40	20.69	.50	-	49	
1943	Panguitch Lake #6		10/20-11/13	"	" " "	" " "	1,400	79	100			1,732.00	28.08	1,760.08	22.28	.93	-	233	
					Total 1943		5,990	650	100			6,293.30	114.92	6,408.22	9.86	1.17	-	860	
	Dixie Unit																		
1944	Upper Mammoth #3		10/9-11/11/44	E. S.	D.engelmanni	Felling, salvage of good logs by sawmills, burning of slabs	125	595	100			3,027.00	102.00	3,129.00	5.26	25.03	-	265	
1944	Panguitch Lake #6		11/21-12/29/44	P. P.	D.ponderosae D.barberi	Felling & burning	1300	201	100			1,617.00	20.00	1,637.00	8.14	1.26	-	222	
	Powell Unit																		
1944	Blue Fly #1		1/1-6/30/44	"	D.ponderosae	" " "	16,500	509	100			3,454.60	97.00	3,551.60	6.98	.22	-	515	
1944	Park #2		5/1-12/31/44	"	" "	Felling & peeling	7,030	120	100			404.49	27.00	431.49	3.60	.06	-	63	
1944	Badger #3		1/1-6/30/44	"	" "	Felling & burning	7,130	658	100			4,481.22	110.00	4,591.22	6.98	.64	-	666	
1944	Blubber #4		7/1-12/31/44	"	" "	Felling & peeling	6,820	106	100			360.15	21.00	381.15	3.60	.06	-	55	
1944	Kanab #5		7/1-12/31/44	"	" "	" " "	10,220	515	100			1,790.84	61.00	1,851.84	3.60	.18	-	269	
1944	Podunk #6		7/1-12/31/44	"	" "	" " "	6,240	111	100			384.13	15.00	399.13	3.60	.06	-	58	
1944	Cameron #12		1/1-6/30/44	"	" "	Felling & burning	1,680	252	100			1,717.36	41.00	1,758.36	6.98	1.05	-	255	
							57,045	3,067	100			17,236.79	494.00	17,730.79	5.78	.31	-	2,368	
1945	Faas Creek #5		5/15 - 6/15/45	P. P.	D.ponderosae	" " "	600	257	100			1,212.00	19.00	1,231.00	4.79	2.05		172	
	Upper Mammoth #3		6/11 - 7/21/45	E. S.	D.engelmani	" "	1,820	4,661*	1.3*			4,292.00	207.00	4,499.00	.97	2.47	1**	377	
	* Treated with Ortho: 1142 green trees standing 1211 dry trees standing 2249 stumps on sale area 59 trees felled, peeled, treated, and hauled away (1.3% felled of total) 4661																		
																	*1 gal. mixture of 1 part [illegible] to 6 parts fuel oil.		
							2,420	4,918	51			5,504.00	226.00	5,730.00	1.17	2.37		549	

REMARKS: